

# Notice of Allowability

Application No.

10/803,910

Examiner

Kaushikkumar Patel

Applicant(s)

HIGAKI ET AL.

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendments filed 9/21/2007.
2. ☒ The allowed claim(s) is/are 21-51.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

  
HYUNG S. SOUGH  
SUPERVISORY PATENT EXAMINER

11/09/07

**DETAILED ACTION**

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Juan Carlos A. Marquez (Reg. No. 34,072) on November 8, 2007.

The application has been amended as follows:

In the claims:

**Claim 21.** (Currently Amended) A storage control device, comprising:

a channel adapter operatively coupled to a computer, to provide upper logical volumes for the computer and to receive data sent from the computer to the upper logical volumes;

a memory operatively coupled to the channel adapter to store the data sent from the computer and configuration information with respect to a configuration of the storage control device;

a disk adapter operatively coupled to the channel adapter and the memory to control reading and writing of the data from/to the memory and to provide inner logical volumes at least one of which is mapped to one of the upper logical volumes, the inner logical volumes being used as storing regions for transmission and reception of the data between the channel adapter and the disk adapter; [[and]]

a plurality of disk drives operatively coupled to the disk adapter, in which the data sent from the computer are written by control of the disk adapter as a data group, wherein a first inner logical volume of the inner logical volumes is mapped to a first upper logical volume of the upper logical volumes and is mapped to a first set of disk drives in the plurality of disk drives, a first data group targeted to the first inner logical volume being written into the first set of disk drives[.];

wherein a second upper logical volume of the upper logical volumes is operatively coupled to control the storage control device and is utilized when the configuration information in the memory is read by the computer[.];

wherein the channel adapter receives a command including a change-over instruction from the computer to be stored in the second upper logical volume, the change-over instruction including information identifying a second inner logical volume of the inner logical volumes to be mapped to the first upper logical volume[.];

wherein the channel adapter maps the second inner logical volume instead of the first inner logical volume to the first upper logical volume in response to the change-over instruction, stored in the second upper logical volume, and the channel adapter further operates to start a second set of disk drives from the plurality of disk drives that are mapped to the second inner logical volume[.];

wherein activation of the second set of disk drives that are mapped to the second inner logical volume starts in response to change-over from the first inner logical volume to the second inner logical volume;

wherein the ~~storage control device~~ channel adapter is configured to change over an inner logical volume mapped to the first upper logical volume from the first inner logical volume to the second inner logical volume in response to ~~[[an]]~~ the change-over instruction which is different from a data reading or writing instruction from the computer coupled to the channel adapter~~[[.]]; and[[.]]~~

wherein, with regard to the first set ~~plurality~~ of disk drives mapping to the first inner logical volume, the ~~storage control device~~ channel adapter is configured to check whether ~~[[for not]]~~ an other ~~[[inner]]~~ upper logical volume ~~[[are]]~~ is mapped to an error check and correction (ECC) group concerning the first set ~~plurality~~ of disk drives in response to change-over from the first inner logical volume to the second inner logical volume, and ~~[[then]]~~ if the other ~~[[inner]]~~ upper logical volume ~~[[are]]~~ is not mapped to the ECC group then the activation of the first set ~~plurality~~ of disk drives stops.

**Claim 31.** (Currently Amended) A storage system coupled to a computer, comprising:

an interface coupled to the computer;

a plurality of disk drives;

a plurality of upper volumes for the computer; ~~[[and]]~~

a plurality of inner volumes which are mapped to the plurality of disk drives, wherein a first upper volume of the plurality of upper volumes is mapped to a first inner volume of the plurality of inner volumes so as to access the first inner volume by the computer~~[[.]];~~

wherein, in response to receiving an access command at the interface from the computer for accessing the first upper volume of the plurality of upper volumes, the first inner

volume mapped to the first upper volume is accessed by the computer via the first upper volume[[.]];

wherein the first upper volume is mapped to a second inner volume of the plurality of inner volumes instead of the first inner volume in response to receiving an instruction from the computer to assign the second inner volume to the first upper volume such that the second inner volume is accessed by the computer via the first upper volume in response to receiving the access command at the interface for accessing the first upper volume[[.]];

wherein activation of disk drives that are mapped to the second inner logical volume starts in response to change-over from the first inner logical volume to the second inner logical volume[[.]];

wherein [[the]] a storage control device is configured to change over an inner logical volume mapped to the first upper logical volume from the first inner logical volume to the second inner logical volume in response to [[an]] the instruction which is different from a data reading or writing instruction from the computer coupled to the storage control device channel adapter[[.]]; and

wherein, with regard to the plurality of disk drives mapping to the first inner logical volume, the storage control device is configured to check whether [[or not]] an other [[inner]] upper logical volume [[are]] is mapped to an error check and correction (ECC) group concerning the plurality of disk drives in response to change-over from the first inner logical volume to the second inner logical volume, and [[then]] if the other [[inner]] upper logical volume [[are]] is not mapped to the ECC group then the activation of the plurality of disk drives

stops.

**Claim 37.** (Currently Amended) A storage control system operatively coupled to an external device, comprising:

a channel adaptor operatively coupled to the external device and configured to provide access to and from a plurality of upper logical volumes;

a memory operatively coupled to the channel adaptor to store at least configuration information for configuration of the storage control system;

a disk adaptor operatively coupled to the channel adaptor and the memory to control reading and writing of the data from/to the memory and to provide a plurality of inner logical volumes being used to store data for transmission and reception between the channel adapter and the disk adaptor; [[and]]

a plurality of disk drives operatively coupled to the disk adaptor[[,.]];

wherein a first inner logical volume of the inner logical volumes is mapped to a first upper logical volume of the upper logical volumes and is mapped to a first set of disk drives of the plurality of disk drives[[,.]];

wherein a second upper logical volume of the upper logical volumes is configured to receive a change-over instruction from the external device, the channel adaptor is configured to receive the change-over instruction by using the second upper logical volume, the change-over instruction including information identifying a second inner logical volume of the plurality of inner logical volumes to be mapped to the first upper logical volume[[,.]];

the channel adaptor is configured to map the second inner logical volume instead of the first inner logical volume to the first upper logical volume in response to the change-over instruction received at the second upper logical volume[.];

the disk adaptor is further configured to operate a second set of disk drives of the plurality of disk drives that are mapped to the second inner logical volume after that the first upper logical volume is mapped to the second inner logical volume instead of the first inner logical volume[.];

wherein activation of the second set of disk drives that are mapped to the second inner logical volume starts in response to change-over from the first inner logical volume to the second inner logical volume[.];

wherein the ~~storage control device~~ channel adapter is configured to change over an inner logical volume mapped to the first upper logical volume from the first inner logical volume to the second inner logical volume in response to ~~[[an]]~~ the change-over instruction which is different from a data reading or writing instruction from the computer coupled to the channel adapter[.]; and

wherein, with regard to the first set ~~plurality~~ of disk drives mapping to the first inner logical volume, the ~~storage control device~~ channel adapter is configured to check whether ~~[[or not]]~~ an other ~~[[inner]]~~ upper logical volume ~~[[are]]~~ is mapped to an error check and correction (ECC) group concerning the first set ~~plurality~~ of disk drives in response to change-over from the first inner logical volume to the second inner logical volume, and ~~[[then]]~~ if the other ~~[[inner]]~~ upper logical volume ~~[[are]]~~ is not mapped to the ECC group then the activation of the first set ~~plurality~~ of disk drives stops.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaushikkumar Patel whose telephone number is 571-272-5536. The examiner can normally be reached on 8.00 am - 4.30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on 571-272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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